DNA Phytogeography on Alpine Plants

1995 Fiscal Year Final Research Report Summary

DNA Phytogeography on Alpine Plants

Research Project

Project/Area Number

06454030

Research Category

Grant-in-Aid for General Scientific Research (B)

Allocation Type

Single-year Grants

Research Field

系統・分類

Research Institution

Kanazawa University

Principal Investigator

SHIMIZU Tatemi Kanazawa Univ., Fac. Sci., Prof., 理学部, 教授 (90021203)

Co-Investigator(Kenkyū-buntansha)

UEDA Kunihiko Kanazawa Univ., Fac. Sic., Ass. Prof., 理学部, 助教授 (60184925)
YAMAGUCHI Kazuo Kanazawa Univ., Inst. Gene Res., Prof., 遺伝子実験施設, 教授 (00019879)

Project Period (FY)

1994 – 1995

Keywords

alpine plants / DNA / DNA phytogeography / sequence / Primula cuneifolia / Pedicularis chamissonis / ヨツバシオガマ / ハイマツ

Research Abstract

The present study aims to establish DNA phytogeography through the procedure to analyze historical aspects of the alpine plants on he basis of variation of nucleotide sequence of DNA.
First of all, a new simple method to extract and amplify total DNA, because usually only small quantity of materials is available in the case of alpine plants. 210 samples of 42 alpine plants were widely collected not only from the Japan Archipelagoes but also from the circumpolar region of Northern

Hemisphere. The intergenic spacer between trnL and trnF in chloroplast DNA was nainly used for this purpose. As the result of sequencing. three cases were recognized as followa :
(1) Species without intraspecific DNA variation as exemplified by Orchis aristata.
(2) Species with intraspecific DNA variation, but gegraphically meaningless, as exemplified by Chamerion angustifolium, Vaccinium vitis-idaea and Solidago virga-aurea.
(3) Species with intraspecific DNA variation geographically significant, as exemplified by Primula cunefolia and Pedicularis chamissonis.
In Primula cuneifolia and Pedicularis chamissonis, 6 and 11 DNA types were detected, respectively. In both species, the plants were divisible into two major groups, north and South. The south groups occupying the Central Moutain Regions of Honshu were found to have differentiated into subgroups in each mountain or mountain range, while the north group was less differentiated and distributed in rather wide area. Such geographical variations of DNA nucleotide sequence is certainly useful for historical anaysis of the alpine plants.

Research Products (6 results)

All | Other

All | Publications (6 results)

[Publications] 藤井紀行・植田邦彦・綿野泰行・清水建美: "Intraspecibic sequence variation in chloroplast DNA of Paimula cuneifolia hedcb. (Primulaceae)" J.Phytogeogr.&) axon.43. 15-24 (1995)

[Publications] 綿野泰行・今津直夫・清水建美: "Chloroplast DNA typing by PCR.SSCP in the Pinus pumila-P.parviflora var.pentaphylla Complex" J.Plant Res.108. 493-499 (1995)

[Publications] 新道聡美・植田邦彦・清水建美 他: "ハクサンコザクラの保全生物学:遺伝的変異と集団の遺伝的分化" 植物地理分類研究. 43. 103-109 (1995)

[Publications] N.Fujii, K.Ueda, Y.Watano & T.Shimizu: "Intraspecific sequence variation in chloroplast DNA of Promulacuneifolia Ledeb. (Primulaceae)." J.Phytogeogr. & Taxon.43. 15-24 (1995)

[Publications] Y.Watano, M.Imazu & T.Shimizu: "Chloroplast DNA typing by PCR-SSCP in the Pinus pumila-P.parviflora var. pentaphylla complex (Pinaceae)." J.Plant Res.108. 493-499 (1995)

[Publications] S.Shindo, K.Ueda, T.Shimizu, et al.: "Consevation biology of Primula cuneifolia var. hakusanensis : genetic variation and differentiation of popilations." J.Phytogeogr. & Taxon.43. 103-109 (1995)

URL: https://kaken.nii.ac.jp/report/KAKENHI-PROJECT-06454030/064540301995kenkyu_seika_hokoku_

Published: 1997-03-03